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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DONALD R. VAN DER MOERE, BRENT A. NEWKIRK,
BRADLEY J. OBLAK and JOHN L. CAGNEY

Appeal No. 2008-2600
Application No. 10/802,984
Technology Center 3600

Decided: September 29, 2008

Before WILLIAM F. PATE, III, ANTON W. FETTING and STEVEN D. A.
McCARTHY, *Administrative Patent Judges*.
PATE, *Administrative Patent Judge*.

DECISION ON APPEAL
STATEMENT OF THE CASE

This is an appeal of the rejection of claims 1, 3-8, 10-15, and 17-21 rejected in a non-final office action mailed July 27, 2006. Claims 2, 9, and 16 have been cancelled. All pending claims stand twice rejected. We have jurisdiction under 35 U.S.C. §§ 134 and 6(b) (2002).

The claimed invention is directed to a piston pin wherein the exterior margin of the hollow pin has been coated with chromium nitride.

Claim 1, reproduced below, is further illustrative of the claimed subject matter:

1. A piston pin, comprising:
a piston pin exterior margin, the exterior margin being coated with a chromium-nitride coating, the coating being shiftably matable with an inside margin of a pin bore of a connecting rod without the employment of an intervening bushing.

Claim 8 is directed to a piston pin and connecting rod claimed in combination, while claim 15 is directed to a method of forming a piston pin and inserting the piston pin into the connecting rod.

The references of record relied upon by the Examiner as evidence of anticipation and obviousness are:

| | | |
|--------------|-----------|---------------|
| McKone | 1,491,155 | Apr. 22, 1924 |
| Wakefield | 3,757,378 | Sep. 11, 1973 |
| Kochendorfer | 4,406,558 | Sep. 27, 1983 |
| Fukutome | 5,601,293 | Feb. 11, 1997 |
| Komuro | 5,851,659 | Dec. 22, 1998 |

Claims 1, 3, 4, 6 and 7 stand rejected under 35 U.S.C. § 102(b) as anticipated by Komuro.

Claim 5 stands rejected under 35 U.S.C. § 103 as unpatentable over Komuro.

Claims 8, 10, and 15 stand rejected under 35 U.S.C. § 103 as unpatentable over McKone in view of Kochendorfer.

Claims 10-12 and 17-19 stand rejected under 35 U.S.C. § 103 as unpatentable over McKone in view of Kochendorfer and further in view of Komuro.

Claims 13 and 20 stand rejected under 35 U.S.C. § 103 as patentable over McKone in view of Kochendorfer, Komuro and Fukutome.

Claims 14 and 21 stand rejected under 35 U.S.C. § 103 as patentable over McKone in view of Kochendorfer, Komuro, Fukutome and further in view of Wakefield.

A rejection of claims 8 and 10-14 under 35 U.S.C. § 112, second paragraph, was withdrawn by the Examiner in the Answer. Answer 1:17-20.

FINDINGS OF FACT

1. Komuro is directed to piston rings and the method of manufacturing such rings. Komuro states that the prior art has used chromium nitride as a coating for piston rings and has applied the chromium nitride by Physical Vapor Deposition. Col. 1, ll. 22-29. Komuro intends to improve upon this process by applying the chromium nitride such that the columnar crystal structures of the chromium nitride are present in a tension fracture surface of the coating. See col. 2, ll. 27-33. Figures 4 and 5 illustrate pistons rings prepared according to the invention. Figure 3 is of interest. Figure 3 shows an article 13 which is a pin with a hollow interior margin. The exterior cylindrical surface of the pin 13 is provided with a coating of chromium nitride. The test piece or pin 13 is rotated on mandrel or test roller 11 and pressed against load roller 12 while spun at high speed with lubrication applied thereto. See col. 7, ll. 45-67. As noted above, the coating of Komuro is from 1-80 micrometers in thickness with a thickness of 35 to 50 micrometers preferred. See col. 3, ll. 16-28.

2. McKone is directed to the connecting rod and wrist pin for an internal combustion engine. McKone, 1: 13-18. The object of the McKone invention is to

permit slight lateral movement by the provision of a semi-spherical joint either in the piston or on the crankshaft. Of interest is Figure 6 of McKone which shows a modified form of the invention wherein the semi-spherical connection is on the crankshaft. Figure 6 appears to show the wrist pin 17 is inserted in the connecting rod without the presence of a bushing or a bearing. However, Appellants direct our attention to McKone, 2:89 – 91, wherein McKone states that the end of the connecting rod bearing on the wrist pin has the usual cylindrical bearing thereon.

3. Kochendorfer shows a piston pin or gudgeon pin wherein the objective of decreasing the weight of the gudgeon pin is achieved by having the pin comprised of a fibre-reinforced composite material with an outer metallic sliding bearing layer. See col. 2, ll. 5-16. The bearing layers as disclosed in Kochendorfer are hard nitrides, borides or silicides of the metals in the third to sixth groups of the periodic table. Chromium is one of the elements of this section of the periodic table. Thus, chromium nitride is contemplated in the reference to Kochendorfer. See col. 2, ll. 47- 49.

4. Fukutome is directed to pistons rings which have been treated with hard chromium plating or nitriding. Fukutome discloses buff polishing to increase the wear resistance and decrease the surface roughness of these coated articles. See col. 7, lines 18-21.

5. Wakefield teaches centerless buffing as a surface finishing technique.

PRINCIPLES OF LAW

A single prior art reference that discloses, either expressly or inherently, each limitation of a claim invalidates that claim by anticipation. *Minn. Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1565

(Fed.Cir.1992). Thus, a prior art reference without express reference to a claim limitation may nonetheless anticipate by inherency. See *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 1349 (Fed. Cir. 2002). “Under the principles of inherency, if the prior art necessarily functions in accordance with, or includes, the claims limitations, it anticipates.” *Id.* (quoting *MEHL/Biophile Int’l Corp. v. Milgraum*, 192 F.3d 1362, 1365 (Fed.Cir.1999)). Moreover, “[i]nherency is not necessarily coterminous with knowledge of those of ordinary skill in the art. Artisans of ordinary skill may not recognize the inherent characteristics or functioning of the prior art.” *Id.*; see also *Schering Corp. v. Geneva Pharms.*, 339 F.3d 1373, 1377 (Fed.Cir.2003) (rejecting the contention that inherent anticipation requires recognition in the prior art) (citing *In re Cruciferous Sprout Litig.*, 301 F.3d at 1351; *MEHL/Biophile*, 192 F.3d at 1366).

If a reference spells out a definite and limited class of compounds that enabled a person of ordinary skill in the art to at once envisage each member of this limited class, the reference places the claimed substance in the possession of the public and therefore makes out anticipation. See *In re Petering* 301 F.2d 676, 682 (C.C.P.A. 1962) and *In re Schaumann* 572 F.2d 312, 316 (C.C.P.A. 1987).

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of ordinary skill in the art, and (4)

where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). *See also KSR*, 127 S.Ct. at 1734 (“While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.”)

In *KSR*, the Supreme Court emphasized “the need for caution in granting a patent based on the combination of elements found in the prior art,” *id.* at 1739, and reaffirmed principles based on its precedent that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Id.* The Court explained:

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

Id. at 1740. The operative question in this “functional approach” is thus “whether the improvement is more than the predictable use of prior art elements according to their established functions.” *Id.*

In rejecting claims under 35 U.S.C. § 103(a), the examiner bears the initial burden of establishing a *prima facie* case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). *See also In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984). Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the appellant. *Id.* at 1445. *See also Piasecki*, 745 F.2d at 1472. Obviousness is then determined on the basis of the evidence as a

whole and the relative persuasiveness of the arguments. *See Oetiker*, 977 F.2d at 1445; *Piasecki*, 745 F.2d at 1472.

ANALYSIS

We will affirm the anticipation rejection of claims 1, 3, 4, 6 and 7. We are in agreement with the Examiner that the pin claimed in claim 1 is indistinguishable from the test piece or pin 13 shown in Figure 3 of Komuro. The only structure positively recited is a piston pin which is hollow, that has an inside margin of a pin bore, and which has an exterior margin or coating of chromium nitride.

We first note that the connecting rod is not positively recited or claimed in this claim, inasmuch as the claim is directed to a piston pin. As to the limitation that the pin is “matable” with the inside margin of a pin bore of a connecting rod, we note that the suffix “-able” indicates in English that the word so modified is “capable of”. Consequently, matable denotes an article that can be but is not required to be mated. Note the following holding from *In re Collier*, 397 F.2d 1003, 1006 (C.C.P.A. 1968), a decision of the predecessor to our reviewing court:

“The main fault we observe in claim 17 is indefiniteness in the sense that things which may be done are not required to be done.

For example, the ferrule connector member is crimpable but not required, structurally, to be crimped; the ground wire ‘means,’ which we take to be a piece of wire, is for disposition under the ferrule but is not required to be disposed anywhere; it becomes displaced when the ferrule is crimped but that may never be, so far as the language of claim 17 is concerned. These cannot be regarded as structural limitations and therefore not as positive limitations in a claim directed to structure.”

Thus, that some pin may be “matable” relates to a situation which may very well never be. It is certainly not required by the express claim language. Therefore, the

matable feature cannot be regarded as a structural limitation in any positive sense, and Appellants cannot rely on it to distinguish over the prior art. Consequently, the claim containing the matable limitation is seen to read on any pin of stock material as long as it is hollow and coated with chromium nitride.

Appellants further argue that one of ordinary skill in the art would not consider the test piece 13 of Komuro as being a piston pin because Komuro is not a pin but rather a test piece. Even if it were true that one of ordinary skill would not regard the pin 13 as a piston pin, and we hold it as unproven on this record, inherency is not necessarily coterminous with knowledge of those of ordinary skill in the art. Artisans of ordinary skill may not recognize the inherent characteristics or functioning of the prior art. See *Cruciferous* at 1349. Thus, it is our conclusion that the Examiner's finding of anticipation of claim 1 has not been shown to be erroneous by the Appellant. Claims 3, 4, 6 and 7 fall with claim 1. See Brief at 6.

We also will affirm the rejection of claim 5 under 35 U.S.C. § 103 as unpatentable over Komuro. As noted above, Komuro shows a range of one to eighty micron of depth of the chromium nitride coating. The Examiner has stated that the depth of the coating is a matter of design choice on the part of one of ordinary skill. Appellant does not rebut this legal conclusion with any evidence, and instead premises the patentability of claim 5 on the limitations of claim 1. Therefore, we affirm the rejection of claim 5 on this obviousness ground.

Turning to the rejection of independent claims 8 and 15, the Examiner has cited McKone as showing a piston pin which is connected to the connecting rod without an intermediate member such as a bushing or a bearing. The Examiner refers us to Figure 6 of McKone which indeed illustrates a piston pin and a connecting rod without a bushing or a bearing in between. On the other hand, the

Appellants refer us to the text of McKone at 2:89-91 where McKone states that the end of the connecting rod bearing on the wrist pin “has the usual cylindrical bearing thereon.” It is apparent that the Examiner is interpreting this bearing as the inside round surface of the connecting rod, inasmuch as McKone has not stated that there is a separate bushing. However, it is quite apparent that McKone is using the word bearing for what the Examiner would call a bushing, for, with regard to Figure 1, McKone states that this embodiment is “provided with a semi-spherical bearing fitting over the bearing 5.” See McKone 2: 34-37. Therefore, whether McKone discloses a piston pin-connecting rod connection without a bushing or not is unclear on this record. However, our jurisprudence provides a solution to this dilemma. The Examiner bears the burden of proof by a preponderance of the evidence. That is, the Examiner must establish that it is more likely than not that the reference discloses a certain feature. In this case, the Examiner must establish that it is more likely than not that McKone contemplates a piston pin-connecting rod connection without a bearing or bushing therebetween. The Examiner has not established this fact to a preponderance of the evidence. Therefore, it is our conclusion that McKone would not have taught one of ordinary skill to use a piston pin in a connecting rod connection that is without the employment of an intervening bushing.

The references to Kochendorfer, Fukutome, Komuro and Wakefield have not been cited to disclose this feature, and this feature is necessary to establish the prima facie obviousness of the subject matter of independent claims 8 and 15 and the claims that depend therefrom. Accordingly, we are constrained to reverse the obviousness rejections of claims 8, 10-15, and 17-21.

CONCLUSION

The rejection of claims 1, 3, 4, 6 and 7 under 35 U.S.C. § 102(b) as anticipated by Komuro is affirmed.

The rejection of claim 5 under 35 U.S.C. § 103 as unpatentable over Komuro is affirmed..

The rejection of claims 8, 10, and 15 under 35 U.S.C. § 103 as unpatentable over McKone in view of Kochendorfer is reversed.

The rejection of claims 10-12 and 17-19 under 35 U.S.C. § 103 as unpatentable over McKone in view of Kochendorfer and further in view of Komuro is reversed.

The rejection of claims 13 and 20 under 35 U.S.C. § 103 as patentable over McKone in view of Kochendorfer, Komuro and Fukutome is reversed.

The rejection of claims 14 and 21 under 35 U.S.C. § 103 as patentable over McKone in view of Kochendorfer, Komuro, Fukutome and further in view of Wakefield is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

JRG

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